

# CBCS SCHEME

18ME824

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## Eighth Semester B.E. Degree Examination, June/July 2024 Automobile Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. What are the basic components of an automobile engine? Briefly explain them. (10 Marks)
- b. Briefly explain the essential components of a valve actuating mechanism. (08 Marks)
- c. What are the functions of piston rings? (02 Marks)

OR

- 2 a. Differentiate between wet and dry liners. (05 Marks)
- b. Explain the concept of HCCI engines. What are its advantages and disadvantages? (07 Marks)
- c. Explain thermosyphon and pump circulation system. (08 Marks)

### Module-2

- 3 a. With a neat sketch, explain the working of single plate clutch. (07 Marks)
- b. Explain the working of overdrive operation. (05 Marks)
- c. An automobile weighing 13445N makes an emergency stop at 95km/hr at which the total resistance is 805N. Assume coefficient of adhesion as 0.5. Calculate:
  - i) The retarding force, if the brakes are applied to locking point.
  - ii) Heat flow per minute at each wheel at the beginning of braking. (08 Marks)

OR

- 4 a. What are the requirements of a good braking system? (06 Marks)
- b. Compare between disk brakes and drum brakes. (06 Marks)
- c. A passenger car with all wheel brakes weighing 1300N makes an emergency stop at 96km/hr. The rolling and air resistance at 96km/hr is 820N total. The coefficient of adhesion is 0.5. Calculate:
  - i) The retarding force if the brakes are applied at locking point.
  - ii) Heat flow per second at each wheel at the beginning of braking. (08 Marks)

### Module-3

- 5 a. What are different types of steering gears? With sketch, explain any two of them. (08 Marks)
- b. With a neat sketch, explain the working of battery ignition system. What are its advantages and disadvantages? (08 Marks)
- c. What are the main objectives of suspension system? (04 Marks)

OR

- 6 a. Explain the principle of air suspension system write its advantages over conventional metal springs. (08 Marks)
- b. Differentiate between battery and magneto ignition system. (05 Marks)
- c. Explain the working of rotating armature type ignition system. (07 Marks)

**Module-4**

- 7 a. Explain the following types of super charger:  
i) Centrifugal type (08 Marks)  
ii) Vane type. (06 Marks)
- b. Compare mechanical supercharging and turbocharging. (06 Marks)
- c. Explain normal and abnormal combustion in SI engines. (06 Marks)

**OR**

- 8 Write note on:  
a. Conventional fuels used in IC engines.  
b. Cetane and octane numbers  
c. Electronic injection system  
d. Common rail direct injection system. (20 Marks)

**Module-5**

- 9 a. Describe the exhaust gas recirculation device for the control of oxides of nitrogen. (08 Marks)
- b. Explain the working of positive crank case ventilation system. (06 Marks)
- c. Write note on:  
i) Motor vehicle act.  
ii) Emission standards. (06 Marks)

**OR**

- 10 a. Explain the various methods used to reduce pollutants in the exhaust gases. (08 Marks)
- b. Explain :  
i) Air injection system  
ii) Air aspirator valve  
iii) Catalytic converter package. (12 Marks)

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